WHAT IS CLAIMED IS:

1. A data collection and measurement device collecting data with substantially zero dead time, comprising:

a) a circular buffer comprising a plurality of data storage areas that are linked to receive and consecutively store incoming data from a plurality of successive sampling periods for at least one event of a measurement device, where each data storage area is configured to receive and store data from one sampling period, and the data storage areas are linked in an order that provides storage for data from a next-in-time sampling period into the next-in-order data storage area;

b) a First Pointer;

c) a Second Pointer; and

d) at least one Digital Signal Processor (DSP), where the First Pointer directs receipt and storage of data of the next-in-time sampling period into the next-in-order data storage area, and, once all data storage areas contain data, directs receipt of data of the next-in-time sampling period, and storage by overwriting therewith data in the next-in-order data storage area, the Second Pointer is directed to the data storage area that stores data from a sample period preceding a current time of data receipt and storage by a fixed trailing distance as referenced to the First Pointer, and directs one of the at least one DSPs to read and process data in the data storage area to which the Second Pointer is directed, and wherein once the next-in-time data have been stored, the First Pointer advances to the next-in-order data storage area, and once data in the

data storage area to which the Second Pointer is directed have been processed, the Second Pointer advances to the next-in-order data storage area;

wherein said collection and measurement device collects and processes data from at least one event; and

wherein the fixed trailing distance equals at least a longest possible time for an event.

2. The data collection and measurement device of claim 1, where the fixed trailing distance is about 10 to about 100 milliseconds.

3. A flow analyzer collecting data with substantially zero dead time for at least one event, comprising:

at least one buffer having a plurality of data storage areas that are adapted to receive and store incoming data from a plurality of sampling periods for the at least one event collected by said flow analyzer, said at least one buffer including previously stored data from a sample period preceding a current time of the receipt and the storage of the data and including an addressable range of the plurality of data storage areas to go sufficiently backward in the plurality of sampling periods; and

at least one processor connected to said at least one buffer, receiving the data from the at least one of the plurality of data storage areas of

said at least one buffer, and said flow analyzer collecting and processing the data from the at least one event with substantially zero dead time by reading from said at least one buffer the previously stored data from the sampling period preceding the current time of the plurality of sampling periods.

4. The flow analyzer of claim 3, where the flow analyzer is a flow cytometer.

5. A flow analyzer collecting data with substantially zero dead time for at least one event, comprising:

at least one buffer means for having a plurality of data storage areas that are adapted to receive and store incoming data from a plurality of sampling periods for the at least one event collected by said flow analyzer, said at least one buffer means for including previously stored data from a sample period preceding a current time of the receipt and the storage of the data and including an addressable range of the plurality of data storage areas to go sufficiently backward in the plurality of sampling periods;

at least one processor for receiving the data from the at least one of the plurality of data storage areas of said at least one buffer means, and said flow analyzer collecting and processing the data from the at least one event with substantially zero dead time by reading from said at least one buffer means the

previously stored data from the sampling period preceding the current time of the plurality of sampling periods.

6. The flow analyzer of claim 5, where the flow analyzer is a flow cytometer.